

OPERATING SUMMARY

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W38  
1973  
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FORT FRANCES

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FORT FRANCES  
WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF FORT FRANCES

by the

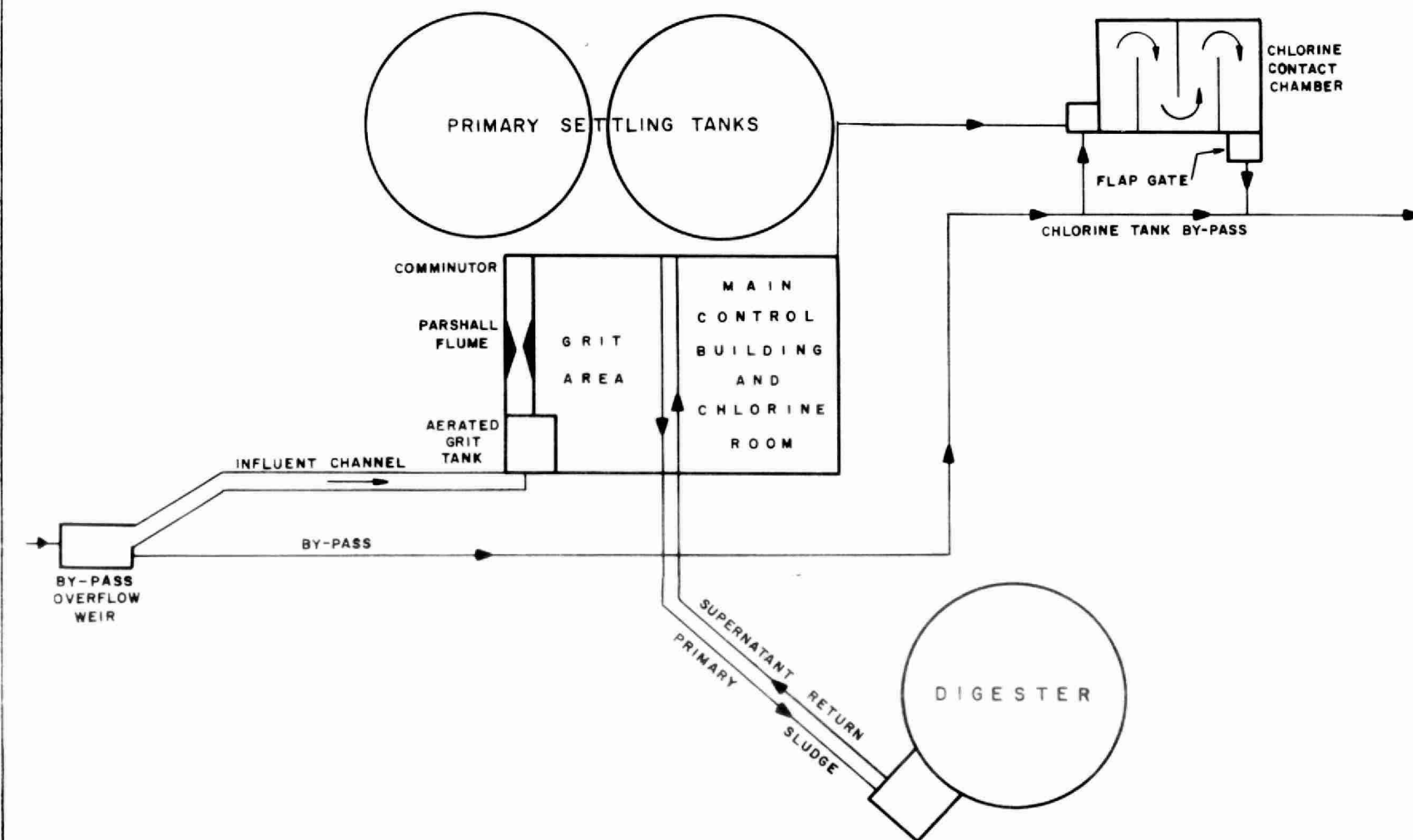
MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

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FORT FRANCES W P C P  
FLOW CHART



## DESIGN DATA

PROJECT Fort Frances WPCP

PROJECT NO. 2-0060-59

TREATMENT Primary

DESIGN FLOW 2.0 mgd

DESIGN POPULATION 12,000

BOD - Raw Sewage 130 mg/l  
- Removal 40%

SS - Raw Sewage 180 mg/l  
- Removal 60%

### PRIMARY TREATMENT

#### Screening

- Coarse bar screen (2")

#### Comminution

Type: Smith & Loveless Model 15R

#### Grit Removal

Type: Aerated; grit removed by clamshell bucket

Size: One 10' 5" x 10' 5" x 13' 9" swd  
(1515 cu ft or 9,400 gal)

Retention: 6.8 min

#### Air Supply

Type: Roots-Connersville  
Size: One 100 scfm @ 9 psi

#### Primary Sedimentation

Type: Eimco Process  
Size: Two 40' x 40' x 10' swd  
(32,000 cu ft or 200,000 gal)  
Retention: 2.4 hours

Loading: Surface, 625 gal/ft<sup>2</sup>/day  
Weir, 9,660 gal/ft/day

### CHLORINATION

Type: W & T Model A-731  
Size: 400 lb/day

#### Chlorine Contact Chamber

Size: 27' x 20' x 8.5' (avg)  
(4,590 cu ft or 28,600 gal)  
Retention: 20.6 min

### OUTFALL

- to Rainy River

### SLUDGE HANDLING

#### Digestion System

Type: Single stage with floating cover:  
gas mixed  
Size: One 40' dia x 25' swd (31,500 cu ft  
or 195,500 gal)  
Loading: 1.38 lb/cu ft/mo  
Mixer: Roots-Connersville Type XA

# '73 Review

## GENERAL

The primary treatment plant and five pumping stations continue to be operated by a chief operator and two operators.

## EXPENDITURES

The total operating cost for 1973 was \$51,243. This represented an average cost of \$67 per million gallons treated and 32 cents per pound of BOD removed.

## PLANT FLOWS AND CHLORINATION

A total of 768.6 million gallons was treated. The average daily flow was 2.1 million gallons which represented 105 per cent of the nominal design capacity. The design capacity was exceeded 40 per cent of the time.

Chlorine was applied on a regular basis at an average dosage of 2.7 mg/l. A total of 20,500 pounds of chlorine was used.

## PLANT EFFICIENCY

The average BOD concentration was reduced from 63 mg/l in the influent to 41 mg/l in the effluent, a 35 per cent reduction. The average influent suspended solids concentration was 110 mg/l. An average reduction of 52 per cent was realized with an average effluent suspended solids concentration of 53 mg/l.

## SLUDGE DIGESTION AND DISPOSAL

A total of 704,800 gallons of raw sludge with an average total solids concentration of 3.6 per cent was pumped to the digester. A total of 810 cubic yards of digested sludge with a total solids content of 6.0 per cent was hauled. The volatile solids content was reduced from 60 to 48 per cent. A total of 377 cubic feet of grit was removed.

## CONCLUSIONS

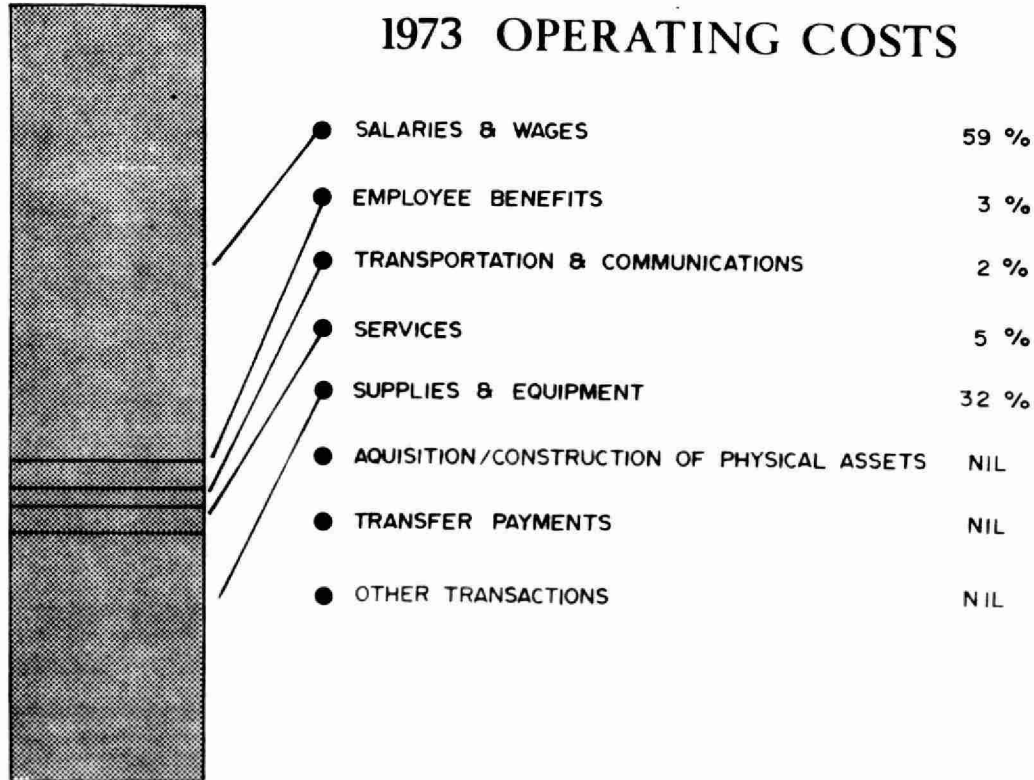
Plant efficiencies were essentially the same as reported in previous reports. However, there was a significant fluctuation in flows through the plant. This has been attributed to a large amount of infiltration into the system. This also has resulted in the plant being hydraulically over loaded 40 per cent of the time.

It is recommended that extensive studies be carried out to locate the major sources of ground water and surface water infiltration to the sewage system and an implementation be initiated. In the interim, the town public works forces should eliminate obvious sources such as eavestroughs and weeping tiles which are connected to sanitary sewers.



# ANNUAL COSTS

## 1973 OPERATING COSTS



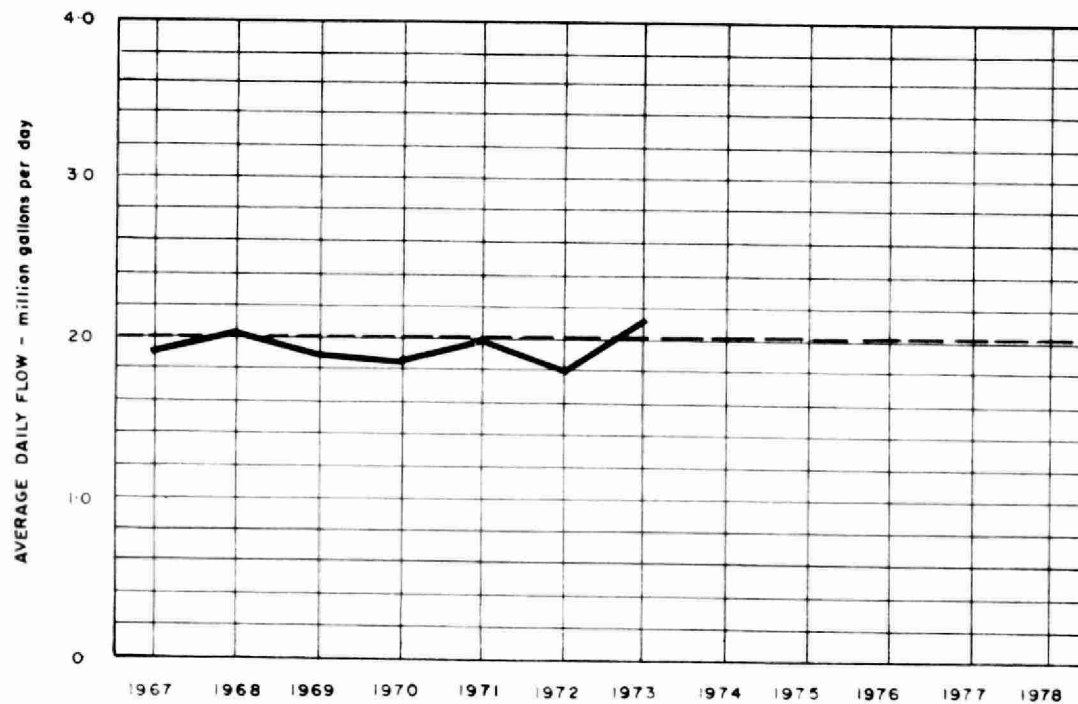
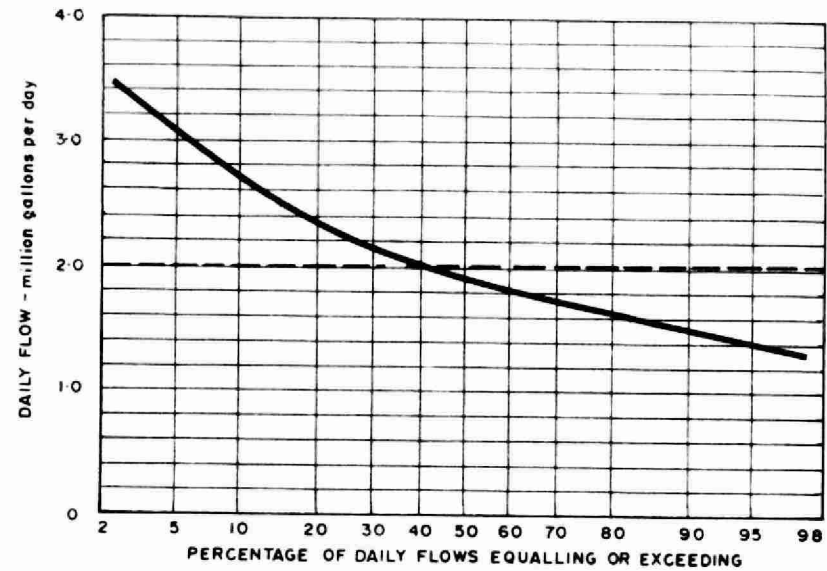
## YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G.	¢/lb BOD
1968	736	\$ 36,705	40	11
1969	693	38,742	56	13
1970	686	44,641	65	14
1971	715	51,519	72	21
1972	657	50,095	76	34
1973	769	51,243	67	32

## OPERATING EXPENDITURES

SALARIES AND WAGES	<u>\$30,183</u>
EMPLOYEE BENEFITS	<u>1,675</u>
TRANSPORTATION & COMMUNICATIONS	<u>821</u>
SERVICES	<u>2,381</u>
SUPPLIES AND EQUIPMENT	<u>16,183</u>
ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	<u>0</u>
TRANSFER PAYMENTS	<u>0</u>
OTHER TRANSACTIONS	<u>0</u>
TOTAL	<u>\$51,243</u>

# PROCESS DATA FLOWS

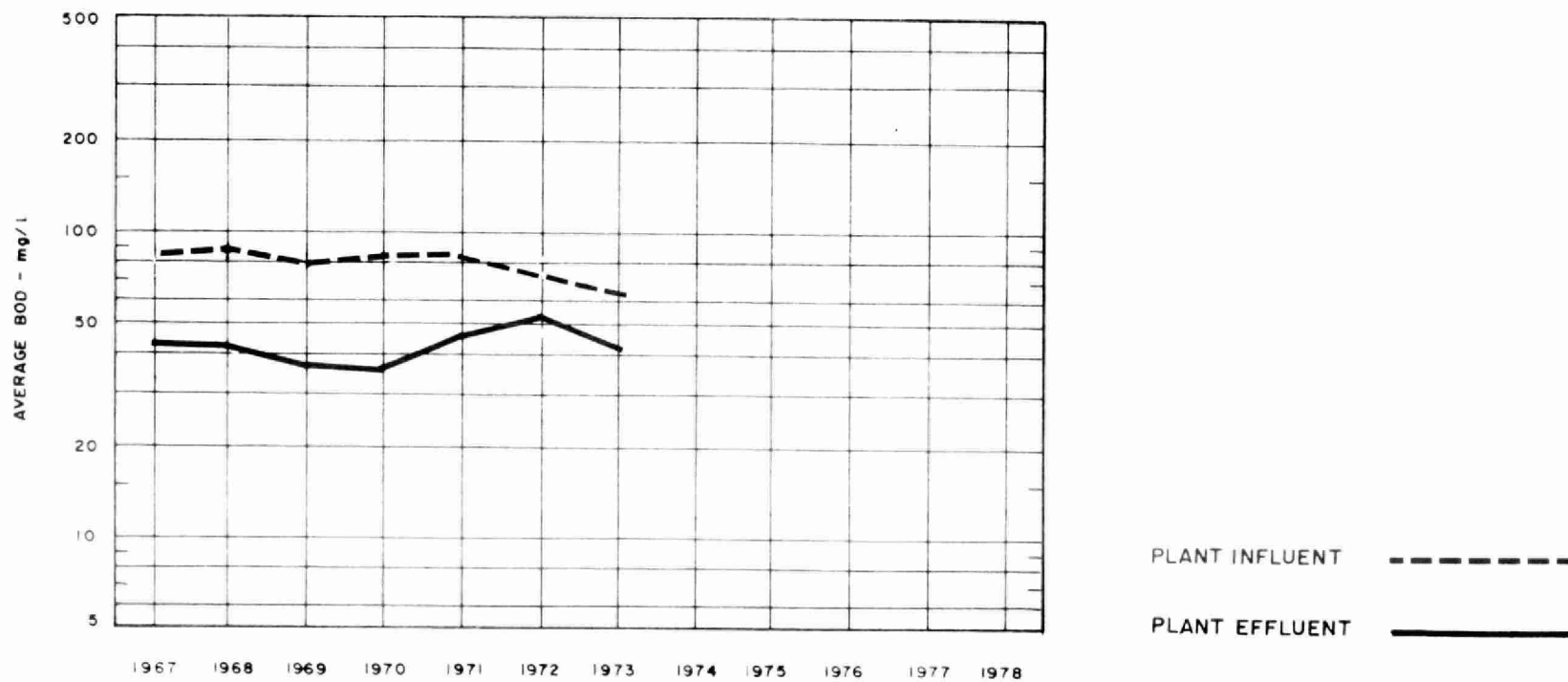
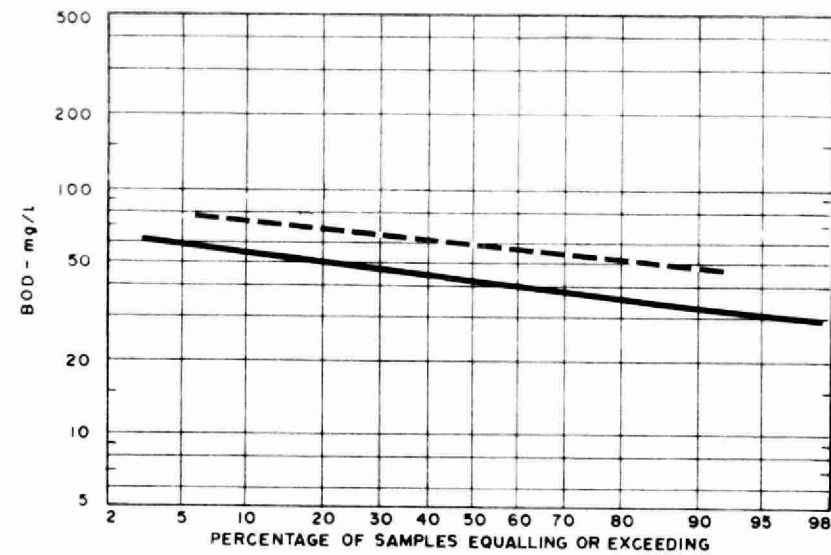


DESIGN CAPACITY - - - - -

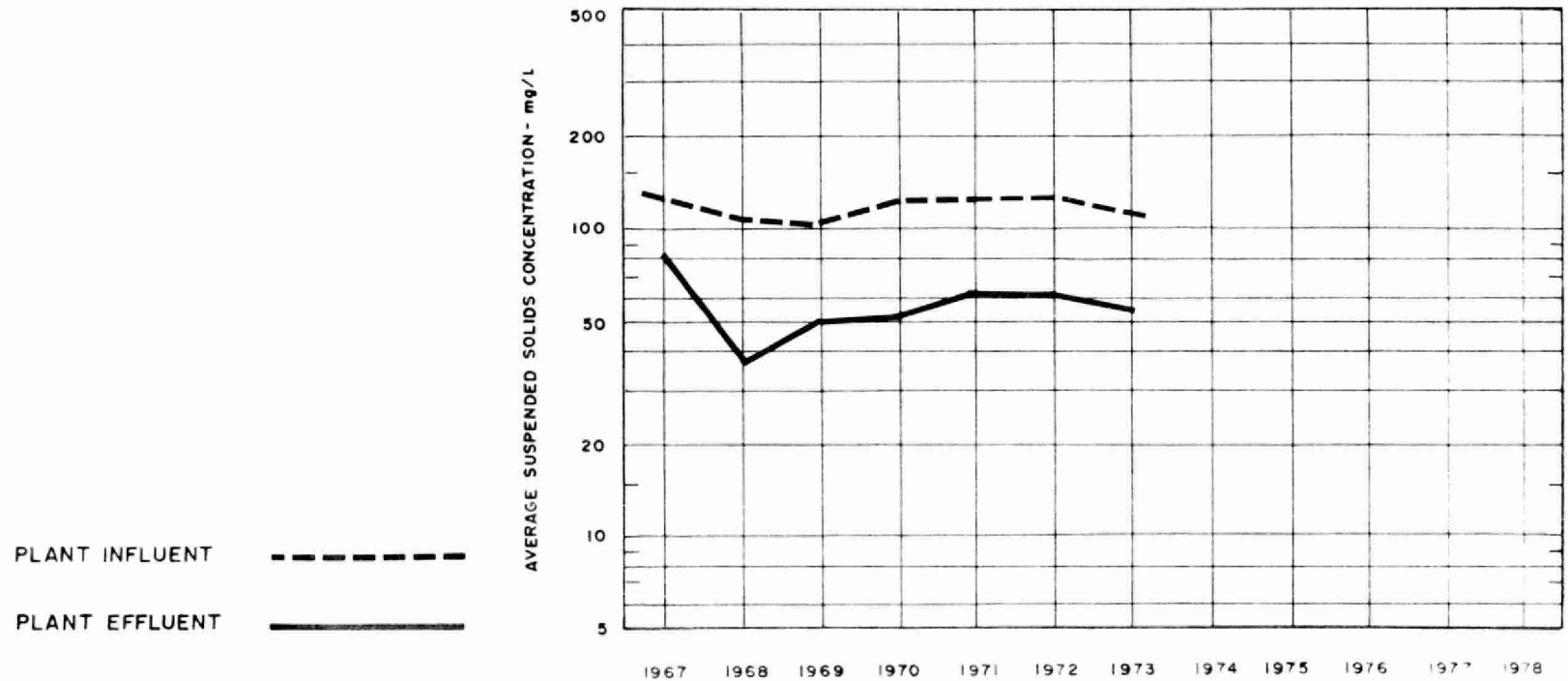
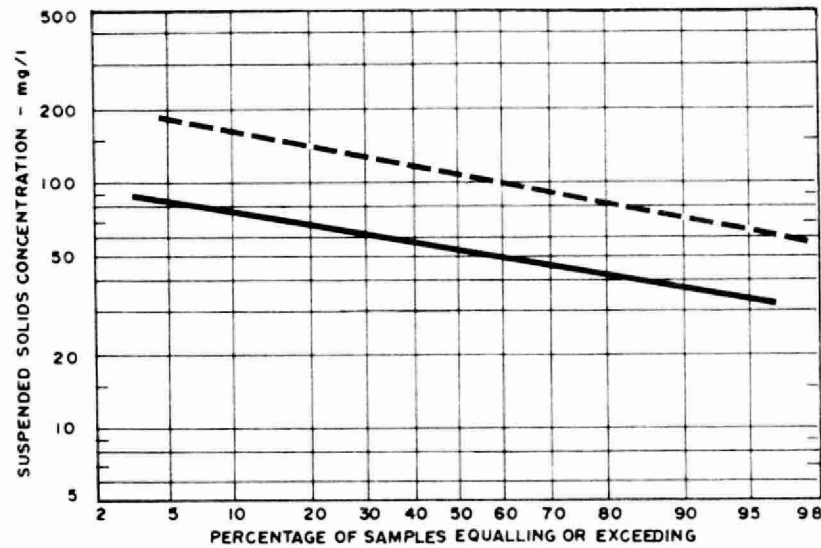
## PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 <sup>3</sup> pounds			%	10 <sup>3</sup> pounds		
JAN	47.3	1.52	1.7	76	46	39	14.2	100	47	54	26.0	6.0	3.6
FEB	41.4	1.48	1.7	67	49	27	7.4	91	41	55	20.7	7.9	5.1
MAR	54.0	1.74	2.5	66	42	36	12.9	100	62	39	21.5	6.2	4.8
APR	56.0	1.87	3.0	72	41	43	17.4	110	50	54	33.0	4.9	4.2
MAY	55.1	1.78	2.0	69	45	35	13.2	120	54	55	35.8	7.9	4.2
JUNE	55.0	1.83	2.2	59	37	37	12.1	130	62	54	39.6		
JULY	66.3	2.14	4.0	64	42	34	14.8	100	53	34	34.4	9.3	5.6
AUG	87.4	2.82	4.3	55	44	20	9.6	140	60	56	65.5	3.2	4.7
SEPT	85.4	2.84	4.2	58	44	24	11.9	120	54	53	52.1		
OCT	85.7	2.76	3.3	52	34	32	15.4	100	45	55	48.0	3.2	2.8
NOV	70.6	2.35	2.7	56	33	41	16.2	110	54	52	41.6	4.1	3.4
DEC	64.4	2.07	2.2	57	31	46	16.7	110	55	50	36.1		
TOTAL	768.6	-	-	-	-	-	161.6	-	-	-	454.3	-	-
AVG.		2.10	MAXIMUM 4.3	63	41	35	13.5	110	53	52	37.9	5.9	4.3
No. of Samples	-	-	-	60	61	-	-	60	59	-	-	9	9

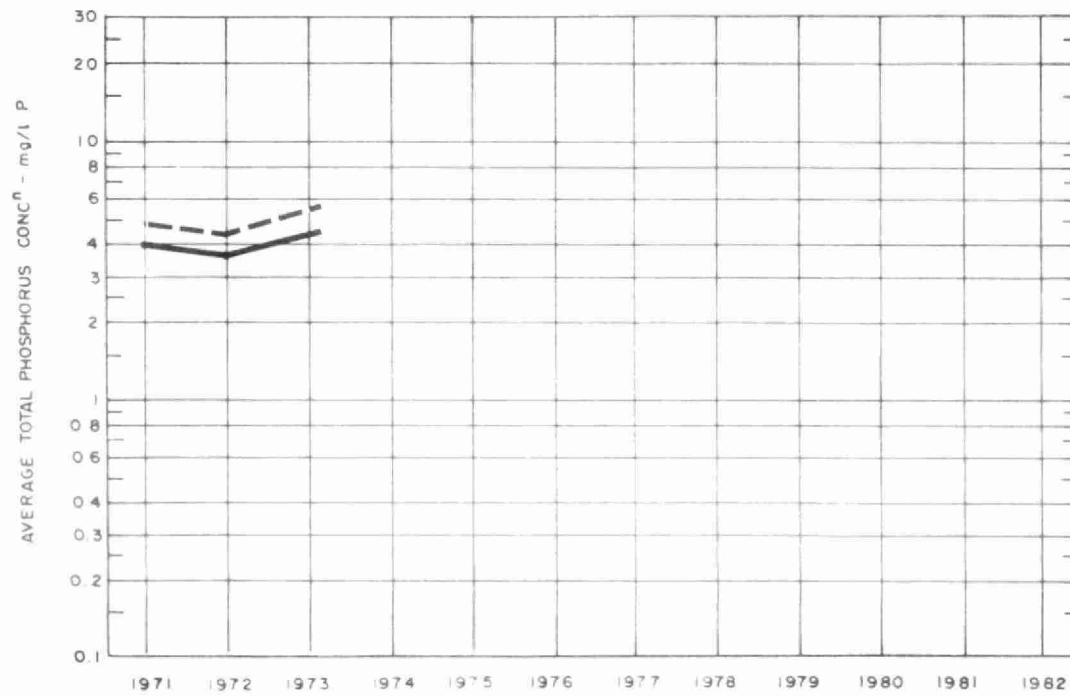
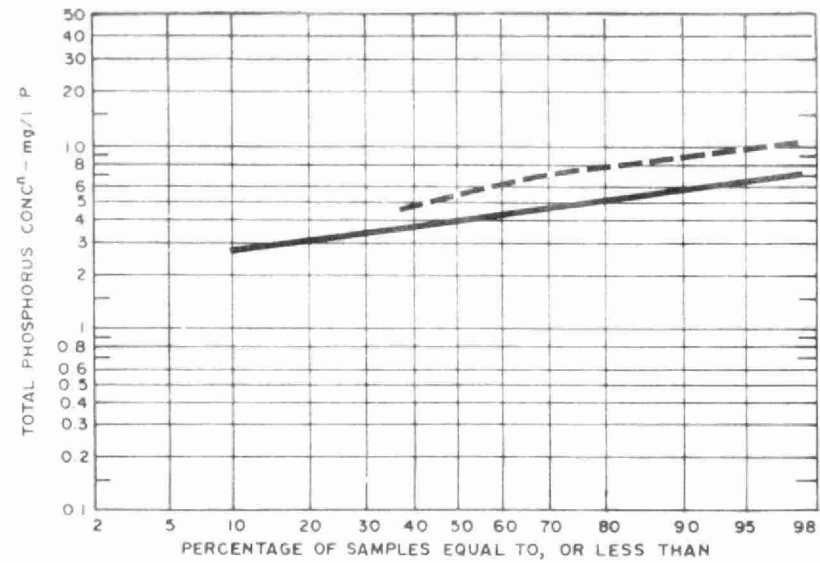
# BIOCHEMICAL OXYGEN DEMAND



# SUSPENDED SOLIDS



# PHOSPHORUS

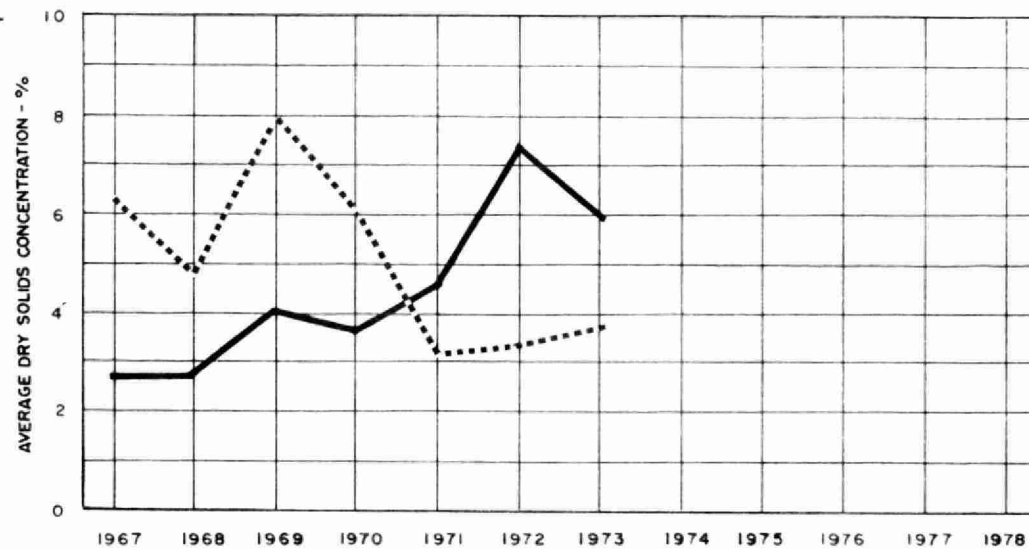


PLANT INFLUENT - - - - -

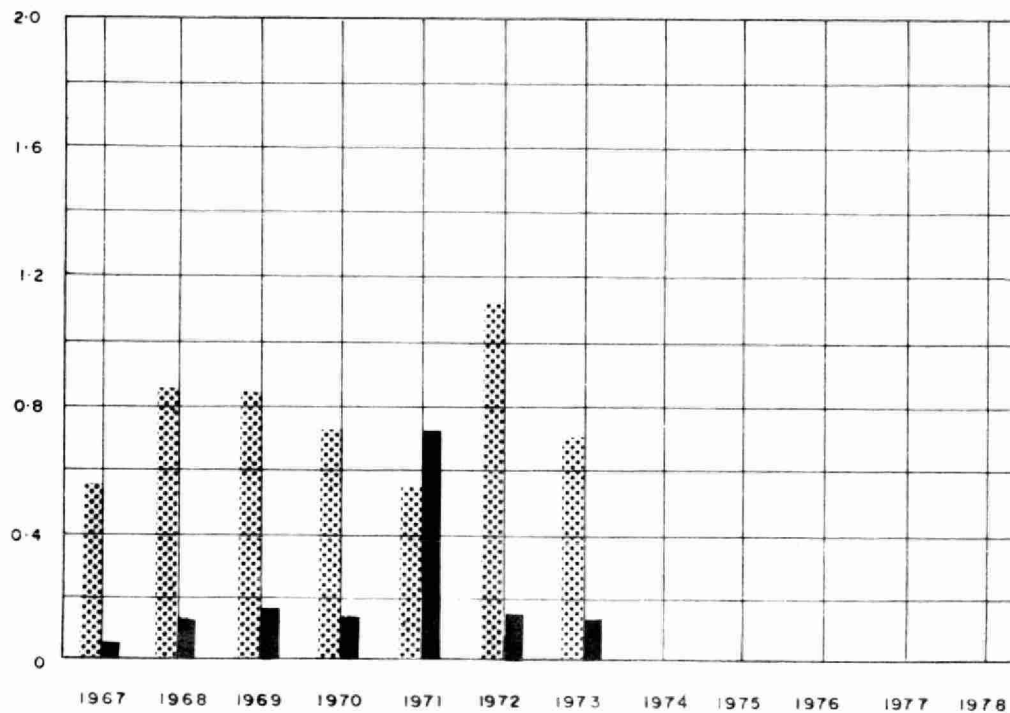
PLANT EFFLUENT —————

# DIGESTION

RAW SLUDGE .....  
DIGESTED SLUDGE ———



QUANTITY OF SLUDGE -  $10^6$  gallons



RAW SLUDGE TO DIGESTER

DIGESTED SLUDGE REMOVED



## TREATMENT DATA

MONTH	GRIT	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CHLORINE USED 10 <sup>3</sup> pounds	AVERAGE DOSAGE mg/l	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	SLUDGE HAULED cubic yards
				QUANTITY 10 <sup>3</sup> gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10 <sup>3</sup> gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	
JAN	27	1.7	3.5	96.2	2.5	72	7.0	4.4	52	0.15	42
FEB	17	1.2	2.9	60.3	2.9	75	10.0	3.8	53	0.08	60
MAR	38	1.7	3.1	66.3	2.0	71	10.0	4.5	52	0.08	60
APR	15	1.2	2.2	59.8	3.2	62	8.0	3.5	58	0.17	48
MAY	25	1.1	2.0	61.2	2.7	63	14.0	7.7	53	0.10	84
JUNE	37	1.7	3.2	50.5	4.2	51	19.0	6.5	49	0.10	114
JULY	37	1.7	2.5	52.3	4.3	55	13.0	6.1	44	0.10	78
AUG	110	1.6	1.9	52.2	5.7	44	14.0	7.0	39	0.10	84
SEPT	61	2.0	2.3	50.6	5.2	49	14.0	9.5	35	0.05	84
OCT	4	2.1	2.5	52.6	4.1	56	9.0	6.1	44	0.07	54
NOV	4	2.0	2.9	50.5	4.5	62	7.0	6.6	48	0.05	42
DEC	2	2.5	3.8	52.3	2.2	60	10.0	5.7	47	0.14	60
TOTAL	377	20.5		704.8	—	—	135.0	—	—	—	810
AVG.	0.4 cubic feet/mil gal	1.7	2.7	58.7	3.6	60	11.3	6.0	48	0.09	68

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